

## ABSTRACT OF THE DISCLOSURE

This invention provides cyanobacteria as an alternative source of *ahas* and *pds* genes for plant transformations and for selectable marking. In particular, it provides for cyanobacteria, for example, *Synechocystis*, as a source of genes encoding herbicide insensitive proteins, and elements of genes for control of expression in plastids. Nucleic acid fragments, both the acetolactate synthase (*ahas*) large subunit and the *ahas* small subunit, were found to provide herbicide resistance. Also, the present invention provides novel *Synechocystis* mutant phytoene desaturase (*PDS*) gene conferring resistance to 4'-fluoro-6-[(alpha,alpha,alpha,-trifluoro-m-tolyl)oxy]-picolinamide, a bleaching herbicide.

The present invention provides improvements to method involving cyanobacteria for the screening of compounds, including a new high-through-put protocol that is a rapid and cost effective way to identify target site genes.